

WHAT IS CLAIMED IS:

1. A furnace component that is exposed to a hydrocarbon containing gas stream, the furnace component comprising an inorganic material; wherein at least a portion of the exposed inorganic material comprises a catalyst that promotes a hydrocarbon reaction to produce an olefin.
2. A furnace component according to claim 1 wherein the inorganic material is a glass, glass-ceramic, or ceramic material.
3. A furnace component according to claim 2 wherein the inorganic material comprises 5-50 weight % MgO and 15-95 weight % B₂O₃.
4. A furnace component according to claim 2 wherein the inorganic material comprises 5-50 weight % MgO and 10-95 weight % P₂O₅.
5. A furnace component according to claim 2 wherein the inorganic material is a barium aluminosilicate.
6. A furnace component according to claim 5 wherein the glass-ceramic material comprises 20-65 weight % BaO, 20-65 weight % SiO₂, and up to 45 weight % Al₂O₃.
7. A furnace component according to claim 1 wherein the inorganic material is a borosilicate glass.
8. A furnace component according to claim 7 wherein the glass comprises 15-60 weight % SiO₂, 5-50 weight % MgO, and 5-50 weight % B₂O₃.
9. A furnace component according to claim 1 wherein the catalyst is chosen from the group consisting of rare earth metals, precious metals, transition metals, non-metals and their corresponding compounds.

10. A furnace component according to claim **9** wherein the catalyst is chosen from the group consisting of Pt, Pd, Ir, Rh, Ru, Ni, Co, Cr, Zn, Ca, Fe, B, P, Mo and their corresponding compounds.
11. A furnace component according to claim **1** wherein the inorganic material is adhered to the surface of a metal substrate.
12. A furnace component according to claim **11** wherein the metal substrate is the inside wall of a hydrocarbon cracking reactor.
13. A furnace component according to claim **1** wherein the inorganic material comprises particles, powder, beads, monoliths, or other structured shapes.
14. A furnace component according to claim **1** wherein the inorganic material is contained within a packed bed.
15. A furnace component according to claim **1** wherein the inorganic material is inserted into the furnace.
16. A furnace component according to claim **1**, further comprising a second catalyst promoting carbon gasification.
17. A furnace component according to claim **16** wherein the second catalyst is chosen from the group consisting of alkali metals, alkaline earth metals, transition metals, and precious metals and their compounds.
18. A furnace component according to claim **17** wherein the second catalyst is K, Ca, Ba, P, Pd, Rh, Mn, V and their compounds.
19. A furnace component according to claim **16** wherein the second catalyst comprises the same material as that of the catalyst of claim **1**.
20. A method of making a furnace component, the method comprising;

- a) melting together the components of a base glass-ceramic material and a catalyst that promotes a carbon reaction to produce an olefin and,
- b) cooling the melt to provide a solid composition.

21. The method according to claim **20** further comprising;

- c) milling the solid composition to yield a powder, and
- d) heating the powder to induce ceraming.

22. A method according to claim **20** wherein the components of the base glass ceramic comprises 5-65 weight. % MgO and 15-95 weight. % B_2O_3 .

23. A method according to claim **20** wherein the components of the base glass ceramic comprises 15-65 weight % MgO and 10-95 weight. % P_2O_5 .

24. A method according to claim **20** wherein the components of the base glass ceramic comprises 20-65weight % BaO, 20-65 weight % SiO_2 , and up to 15 weight % Al_2O_3 .

25. A method according to claim **20** wherein the components of the base glass ceramic comprises 15-60 weight % SiO_2 , 5-50 weight % MgO, and 5-50 weight % B_2O_3 .

26. A method according to claim **20** wherein the catalyst is chosen from the group consisting of rare earth metals, rare earth metal oxides, transition metals, transition metal oxides and non-metal oxides

27. A method according to claim **20** wherein the catalyst is chosen from the group consisting of Pt, Pd, Ir, Rh, Ru, Ni, Co, Cr, Zn, Ca, Fe, B, P, Mo and their corresponding compounds.